WHAT IS CLAIMED IS :

1. A MEMS cantilever actuator mounted on a substrate, the actuator comprising:

an elongated hot arm member having two spaced-apart portions, each provided at one end with a corresponding anchor pad connected to the substrate, the portions being connected together at a common end that is opposite the anchor pads;

an elongated cold arm member adjacent and substantially parallel to the hot arm member, the cold arm member having at one end an anchor pad connected to the substrate, and a free end that is opposite the anchor pad thereof; and

a dielectric tether attached over the common end of the portions of the hot arm member and the free end of the cold arm member to mechanically couple the hot arm member and the cold arm member and keep them electrically independent.

2. The actuator according to claim 1, wherein the dielectric tether is at least partially made of a photoresist material.

3. The actuator according to claim 2, wherein the photoresist material comprises SU-8.

4. The actuator according to claim 1, wherein the dielectric tether is at least partially made of a polyimide.

5. The actuator according to claim 1, wherein the dielectric tether is at least partially made of spin on glass.

6. The actuator according to claim 1, further comprising at least one additional dielectric tether transversally disposed over the hot arm member and the cold arm member.

7. The actuator according to claim 6, wherein the actuator comprises two spaced-apart additional dielectric tethers.

8. The actuator according to claim 6, wherein the additional dielectric tether comprises at least one portion retained in a hole provided on the cold arm member.

9. The actuator according to claim 6, wherein the additional dielectric tether is at least partially made of a photoresist material.

10. The actuator according to claim 9, wherein the photoresist material comprises SU-8.

11. The actuator according to claim 6, wherein the additional dielectric tether is at least partially made of a polyimide.

12. The actuator according to claim 6, wherein the additional dielectric tether is at least partially made of spin on glass.

13. The actuator according to claim 1, wherein the cold arm member comprises a narrower section adjacent to the anchor pad thereof, the narrower section having a width laterally decreased from the exterior compared to a wider section of the cold arm member.

14. The actuator according to claim 13, wherein the narrower section and the wider section are delimited by a square-shaped transition.

15. The actuator according to claim 13, wherein the narrower section and the wider section are delimited by a parabolic transition.

16. The actuator according to claim 13, wherein the narrower section of the cold arm member comprises a heat sink.

17. The actuator according to claim 13, wherein the cold arm member comprises a by-pass segment to reduce the current going through the narrower section.

18. The actuator according to claim 13, wherein the narrower section of the cold arm member is U-shaped.

19. The actuator according to claim 13, wherein the narrower section of the cold arm member is L-shaped.

20. The actuator according to claim 13, wherein the wider section of the cold arm member comprises at least one subsection having an increased interspace with the hot arm member.

21. The actuator according to claim 1, further comprising a tip member attached to the free end of the cold arm member.

22. The actuator according to claim 21, wherein the tip member comprises at least one lateral contact flange.

23. The actuator according to claim 22, wherein one side of the flange is provided with an electrical insulation layer.

24. The actuator according to claim 22, wherein one side of the flange comprises a rounded electrical contact surface.

25. The actuator according to claim 1, further comprising a heat sink on at least one of the portions of the hot arm member.

26. The actuator according to claim 1, wherein the dielectric tether covers more than half of the hot arm member and the cold arm member.

27. A MEMS switch mounted on a substrate, the switch comprising:

a first cantilever actuator comprising:

- a first elongated hot arm member having two spaced-apart portions, each provided at one end with a corresponding anchor pad connected to the substrate, the portions of the first hot arm member being connected together at a common end that is opposite their anchor pads;
- a first elongated cold arm member adjacent and substantially parallel to the first hot arm member, the first cold arm member having at one end an anchor pad connected to the substrate, and a free end that is opposite the anchor pad thereof; and
- a first dielectric tether attached over the common end of the portions of the first hot arm member and the free end of the first cold arm member to mechanically couple the first hot arm member and the first cold arm member and keep them electrically independent; and

a second cantilever actuator comprising:

- a second elongated hot arm member having two spaced-apart portions, each provided at one end with a corresponding anchor pad connected to the substrate, the portions of the second hot arm member being connected together at a common end that is opposite their anchor pads;
- a second elongated cold arm member adjacent and substantially parallel to the second hot arm member, the second cold arm member having at one end an anchor pad connected to the substrate, and a free end that is opposite the anchor pad thereof; and
- a second dielectric tether attached over the common end of the portions of the second hot arm member and the free end of the second cold arm member to mechanically couple the second hot arm member and the second cold arm member and keep them electrically independent;

wherein the first actuator and the second actuator are configured and disposed so that the switch is selectively movable between a closed position where the free ends of the cold arm members are electrically engaged, and an open position where the cold arm members are electrically independent.

28. The MEMS switch according to claim 27, wherein the dielectric tethers are at least partially made of a photoresist material.

29. The MEMS switch according to claim 28, wherein the photoresist material comprises SU-8.

30. The MEMS switch according to claim 27, wherein the dielectric tethers are at least partially made of a polyimide.

31. The MEMS switch according to claim 27, wherein the dielectric tethers are at least partially made of spin on glass.

32. The MEMS switch according to claim 27, further comprising at least one additional dielectric tether transversally disposed over the hot arm member and the cold arm member of at least one of the actuators.

33. The MEMS switch according to claim 27, wherein the cold arm member of each actuator comprises a narrower section adjacent to the anchor pad thereof, each narrower section having a width laterally decreased from the exterior compared to a wider section of the corresponding cold arm member.

34. The MEMS switch according to claim 33, wherein the narrower section of the cold arm member of at least one of the actuators comprises a heat sink.

35. The MEMS switch according to claim 33, wherein the cold arm member of at least one of the actuators comprises a by-pass segment to reduce the current going through the narrower section.

36. The MEMS switch according to claim 33, wherein the narrower section of the cold arm member of at least one of the actuators is U-shaped.

37. The MEMS switch according to claim 33, wherein the narrower section of the cold arm member of at least one of the actuators is L-shaped.

38. The MEMS switch according to claim 33, wherein the wider section of the cold arm member of at least one of the actuators comprises at least one subsection having an increased interspace with the corresponding hot arm member.

39. The MEMS switch according to claim 27, wherein the actuators are configured and disposed to be substantially perpendicular.

40. The MEMS switch according to claim 39, wherein at least one of the actuators further comprises a tip member attached to the free end of the corresponding cold arm member.

41. The MEMS switch according to claim 40, wherein each tip member comprises at least one lateral contact flange, whereby the flanges are in electrical engagement when the MEMS switch is at the closed position thereof.

42. The MEMS switch according to claim 40, wherein surfaces of the tip members are made of a material providing, when mutually-engaged, a lower contact resistance compare to the contact resistance using a material of which the cold arm members are made.

43. The MEMS switch according to claim 42, wherein the material of the surface of each tip member comprises gold and the material of each cold arm member comprises nickel.

44. The MEMS switch according to claim 43, wherein each hot arm member is made of a material comprising nickel.

45. The MEMS switch according to claim 41, wherein one side of the flange of each tip member is provided with an electrical insulation layer, whereby the electrical insulation layers are facing each other at the open position of the MEMS switch.

46. The MEMS switch according to claim 40, wherein the tip member of one of the actuators comprises a lateral contact flange and the tip member of the other actuator comprises an indentation to receive a free end of the flange, whereby the flange and the indentation are in electrical engagement when the MEMS switch is at the closed position thereof.

47. The MEMS switch according to claim 27, further comprising at least one independent side arm member adjacent to one of the actuators, whereby electrical engagement is made between the cold arm member of the corresponding actuator and the independent side arm member when the MEMS switch is at the closed position thereof.

48. The MEMS switch according to claim 27, further comprising a third cantilever actuator adjacent to and symmetrically disposed on the side of the second actuator, the second and the third actuator being configured and disposed so that the cold arm members of the second and third actuators electrically engage that cold arm member of the first actuator when the MEMS switch is at the closed position thereof.

49. The MEMS switch according to claim 48, wherein the first actuator comprises electrically-independent dual cold arm members, each cold arm member of the first actuator being electrically engagable with a respective one of the cold arm member of the second and third actuator when the MEMS switch is at the closed position.

50. The MEMS switch according to claim 27, wherein the first and the second actuator are substantially parallel and offset with reference to the other, the actuators being configured and disposed so that their free ends are in interfering engagement at the closed position of the MEMS switch and out of engagement at the open position thereof.

51. The MEMS switch according to claim 50, wherein at least one of the actuators further comprises a tip member attached to the free end of the corresponding cold arm member.

52. A method of manufacturing a MEMS cantilever actuator to be mounted on a substrate, the method comprising:

providing an elongated hot arm member having two spaced-apart portions, each provided at one end with a corresponding anchor pad connected to the substrate, the portions being connected together at a common end that is opposite the anchor pads;

providing an elongated cold arm member adjacent and substantially parallel to the hot arm member, the cold arm member having at one end an anchor pad connected to the substrate, and a free end that is opposite the anchor pad thereof; and

providing a dielectric tether over the common end of the portions of the hot arm member and the free end of the cold arm member to mechanically couple the hot arm member and the cold arm member and keep them electrically independent.

53. The method according to claim 52, further comprising:

transversally attaching at least one additional dielectric tether over the hot arm member and the cold arm member.

54. The method according to claim 52, further comprising:
providing a tip member at the free end of the cold arm member.

55. The method according to claim 54, wherein the tip member is attached to the free end of the cold arm member by natural over plating adhesion.

56. The method according to claim 54, further comprising:
providing the tip member with at least one lateral contact flange.

57. The method according to claim 56, further comprising:
providing an electrical insulation layer on one side of the flange.